

What is claimed is:

1. A method of designing the cavity length of a tunable laser light source, comprising the steps of:
 - 5 selecting a waveband conforming to an International Telecommunication Union (ITU) grid specification;
determining a minimum constant by which the channel frequencies within the waveband can be multiplied to be converted into integers;
setting an optical path length of the cavity to be the product of a positive integer number and half the product of the minimum constant, a channel frequency and the corresponding central wavelength; and
 - 10 configuring the cavity length according to the optical path length of the cavity.
2. The method according to claim 1, further comprising the step of:
 - controlling the temperature of the cavity within a specific range using a temperature
 - 15 control unit.
3. The method according to claim 2, further comprising the step of:
 - compensating the cavity length for variations caused by assembly tolerance.
4. The method according to claim 2, wherein the temperature control unit comprises an electrical heating regulator and a thermistor.
- 20 5. The method according to claim 1, further comprising the step of:
 - installing a plurality of optical components.
6. The method according to claim 5, wherein the step of configuring the cavity length according to the optical path length of the cavity is accomplished according to the optical path length of the cavity and refractive indices of the optical components.
- 25 7. The method according to claim 5, wherein the optical components comprise a semiconductor laser, a lens, a tunable filter and a plane mirror.